

Causes of an elevated alkaline phosphatase

Marked elevation (≥4 times the upper limit of normal)*	Extrahepatic biliary obstruction¹
	Cholelithiasis (most common) <ul style="list-style-type: none"> Uncomplicated Complicated (biliary pancreatitis, acute cholangitis)
	Malignant obstruction <ul style="list-style-type: none"> Pancreas Gallbladder Ampulla of Vater Bile duct Metastasis to perihilar lymph nodes
	Biliary strictures <ul style="list-style-type: none"> Primary sclerosing cholangitis with extrahepatic bile duct stricture Complications after invasive procedures Chronic pancreatitis with stricturing of distal bile duct Biliary anastomotic stricture following liver transplantation
	Infections <ul style="list-style-type: none"> AIDS cholangiopathy <i>Ascaris lumbricoides</i> Liver flukes
	Intrahepatic cholestasis
	Drug and toxins associated with cholestasis ^Δ
	Primary biliary cholangitis ^Δ
	Primary sclerosing cholangitis ^Δ
	Intrahepatic cholestasis of pregnancy
	Benign postoperative cholestasis
	Total parenteral nutrition
	Infiltrative diseases ^Δ <ul style="list-style-type: none"> Amyloidosis Lymphoma Sarcoidosis Tuberculosis Hepatic abscess
	Metastatic carcinoma to the liver ^Δ
	Liver allograft rejection
	Ischemic cholangiopathy
	Alcoholic hepatitis
	Sickle cell disease (hepatic crisis)
	Nonhepatic causes[◇]
	Transient hyperphosphatemia of infancy and childhood
Moderate elevation (<4 times upper limit normal)	Hepatic causes
	Nonspecific, seen with all types of liver disease including: <ul style="list-style-type: none"> Hepatitis: viral, chronic, alcoholic Cirrhosis Infiltrative diseases of the liver Hypoperfusion states: sepsis, heart failure
	Nonhepatic causes[◇]
	Physiologic (children and adolescents)
	Third trimester of pregnancy
	Influx of intestinal alkaline phosphatase after eating a fatty meal (individuals with blood type O or B)
	High bone turnover <ul style="list-style-type: none"> Growth Healing fractures Osteomalacia Paget disease of bone Osteogenic sarcoma, bone metastasis Hyperparathyroidism Hyperthyroidism
	Extrahepatic disease <ul style="list-style-type: none"> Myeloid metaplasia Peritonitis Diabetes mellitus Subacute thyroiditis

- | | | |
|--|--|--|
| | <ul style="list-style-type: none">■ Gastric ulcer (uncomplicated)■ Extrahepatic tumors<ul style="list-style-type: none">• Osteosarcoma• Lung• Gastric• Head and neck• Renal cell• Ovarian• Uterine• Hodgkin lymphoma | |
|--|--|--|

* The alkaline phosphatase value may vary and be <4 times the upper limit of normal at times (eg, early in the disease process).

¶ May cause an isolated elevation in hepatic alkaline phosphatase if partial obstruction.

Δ May cause an isolated elevation in hepatic alkaline phosphatase.

◇ Alkaline phosphatase may be derived from several sites including the liver, bone, third trimester placenta, intestine, and kidneys. An elevation in alkaline phosphatase with a normal gamma-glutamyl transpeptidase or 5'-nucleotidase suggests a nonhepatic source of alkaline phosphatase.

Graphic 99099 Version 6.0